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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/083,128	BAVANT ET AL.	
	Examiner	Art Unit	
	SALMAN AHMED	2419	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6/8/2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-7 and 9-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1,2,4-7,9,10,18,19 and 25* is/are allowed.

6)☒ Claim(s) *11-17 and 20-23* is/are rejected.

7)☒ Claim(s) *26-29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 May 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 11 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cai et al. (US PAT 6134246, hereinafter Cai) in view of Agarwal et al. (US PAT 6819658, hereinafter Agarwal) and Agarwal2 (US PAT 6963570).

In regards to claim 11, Cai teaches *an apparatus* (Figures 4, 5 and 6, ATM switch 20) *for data transmission between an originating terminal* (Figures 3-6, element 20) *and a terminating terminal* (Figures 3-5, element 50) *in a communications network* (Figures 4, 5 and 6, ATM network) *comprising at least one low-bit-rate artery* (Figures 4 and 5, any one of links 40) *and at least one standard-bit-rate artery* (Figures 4 and 5, links 30

and 60), *comprising a multiplexer device* (Figures 4, 5 and 6, ATM switch 20) *in communication with at least one low-bit-rate artery* (Figures 4 and 5, any one of links 40) *and at least one standard bit-rate artery* (Figures 4 and 5, links 30 and 60), *wherein the switching function of the multiplexer device configured to switch transmitted in basic transmission units according to an adaptation layer protocol among several virtual lines* (column 6 line 59, T1 virtual connections (VCs)) *constituted by connections in multiplexed or non-multiplexed mode* (column 5 lines 46-67, ATM cells are received by the first ATM switch, such as Samsung STARacer ATM switch, over an OC-3 communication link 30. A routing table (RT) 300 then forwards the received ATM cells to a first Segmentation and Re-assembly (SAR) module or chip 310. A first application module 330 associated with the SAR module 310 then assembles the cells into an AAL5 packet and performs a CRC32 check. If the assemble packet is a "good" packet, the SAR module 310 then interrupts an associated central processing unit (CPU) 320 and places the assembled AAL5 packet into a first designated memory location 340. The CPU 320 then adds a sequence number to the placed Protocol Data User (PDU) or AAL5 packet and selects a T1 communication link 40 to communicate the packet. While selecting an outgoing communication link, the CPU selects a T1 link with the lowest traffic load using a load-balancing algorithm. The PDU or AAL5 packet with the sequence number stored therein is then communicated back down to the SAR module 310. The SAR module 310 de-assembles the user packet into a number of ATM cells and communicates all of the de-assembled ATM cells associated with the particular user packet over the selected T-1 communication link 40), *and wherein the data from*

the originating terminal transmitted on the at least one standard-bit-rate artery (Figures 4 and 5, links 30 and 60) *is multiplexed onto the at least one low-bit-rate artery* (Figures 4 and 5, any one of T1 link 40, TITLE: Inverse multiplexing within asynchronous transfer mode communication networks and abstract, Software inverse multiplexing within an Asynchronous Transfer Mode (ATM) communication network is provided by a first ATM switch receiving a stream of ATM cells over a high bandwidth communication link. A Segmentation and Re-assembly (SAR) module associated with the first ATM switch thereafter reassembles the received ATM cells into corresponding user packets. Control data identifying the sequence of assembled user packets are added to each user packet and de-assembled into corresponding ATM cells. The de-assembled ATM cells are then communicated over a plurality of low bandwidth communication links (i.e. multiplexed) to a second ATM switch. Column 2 lines 20-24, The present invention provides a method and apparatus for inverse multiplexing a stream of asynchronous transfer mode (ATM) cells received from a high-bandwidth communication link over a plurality of low-bandwidth communication links), *and an adaptation unit* (figure 4 and 5, element 210) *associated with the terminating terminal, wherein the adaptation unit is configured to*: *extract the packets from the basic transmission units* (column 6 lines 3-20, In a similar fashion, the receiver 230 associated with the second ATM switch 50 receives the ATM cells communicated over one of the T-1 communication links 40 and forwards them to a second SAR module 360 associated therewith. A second application module 370 associated with the second SAR module 360 then reassembles the received ATM cells into a PDU or AAL5 packet and places it in a designated

memory location 380. A CPU 330 associated with the second ATM switch 50 re-sequences the received AAL5 or PDU packet with other packets received over other T-1 communication links and transmits them back down to the second SAR module 360. The second SAR module 360 then de-assembles the AAL5 packets into a number of ATM cells and utilize a routing table 390 to transmit the cells over an outgoing OC-3 communication link 60 in a conventional manner); *and extract the data from the packets* (column 6 lines 3-20, In a similar fashion, the receiver 230 associated with the second ATM switch 50 receives the ATM cells communicated over one of the T-1 communication links 40 and forwards them to a second SAR module 360 associated therewith. A second application module 370 associated with the second SAR module 360 then reassembles the received ATM cells into a PDU or AAL5 packet and places it in a designated memory location 380. A CPU 330 associated with the second ATM switch 50 re-sequences the received AAL5 or PDU packet with other packets received over other T-1 communication links and transmits them back down to the second SAR module 360. The second SAR module 360 then de-assembles the AAL5 packets into a number of ATM cells and utilize a routing table 390 to transmit the cells over an outgoing OC-3 communication link 60 in a conventional manner).

Cai does not explicitly teach multiplexing data from plurality of terminals and compressing data at the originating side and decompressing data at the terminating side.

Agarwal in the same or similar field of endeavor teaches plurality of terminals (figure 4A, T0-T2) being multiplexed (abstract, a method and apparatus for providing for

segmentation, reassembly and inverse multiplexing of variable sized packets and ATM cells over satellite and wireless links); and compressing data at the originating side and decompressing data at the terminating side (column 15 lines 24-28, column 16 lines 62-63 and column 18, lines 47-51, Virtual Channels (VCs) can be configured to be enabled for data compression, which means that the Spackets belonging to the VC are to be passed through a data compressor/decompressor combination to save bandwidth. Spackets which belong to a VC which has been specified to be compressed are compressed in data compressor 2400. Next, compressed Spackets are sent to Data Decompression module 2600, which decompresses the Spackets belonging to a VC which has been configured to be compressed. Compression and decompression histories are maintained in the Data compressor 2400 and the decompressor 2600, respectively).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai's system/method by incorporating the steps of multiplexing data from plurality of terminals and compressing data at the originating side and decompressing data at the terminating side as suggested by Agarwal. The motivation is that multiplexing enables data from multiple sources be transmitted via ccmmon lines, instead of dedicating one line for one source; thus conserving resources. Further motivation is that (as suggested by Agarwal, column 15 lines 24-28) Channels can be configured to be enabled for data compression, which means that the packets belonging to a channel are to be passed through a data compressor/decompressor combination to save bandwidth. Known work in one field of endeavor may prompt

variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

Cai and Agarwal do not explicitly teach determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of voice, fax, or a compression algorithm used to compress the data.

Agarwal2 in the same or similar field of endeavor teaches a fourth field 1268 contains a variable CODING which defines aspects of the corresponding block code 1250 (satisfying limitation "determine a mode of operation") based on the frame number. By way of example, if the value of FRAMENUM is equal to zero, then the fourth field 1268 (or coding field) represents a suggested value of the number of octets which are to be reserved for the block code 1250. Advantageously, the block code 1250 may be generated in accordance with Reed-Solomon Coding (satisfying limitation "the mode of operation comprising at least one of a compression algorithm used to compress the data"). If Reed-Solomon Coding is employed then the coding field 1268 represents a suggested value of the number of Reed-Solomon octets divided by two that the transmitting interface should employ for its own transmissions. Reed-Solomon Coding is implemented in the form of check-bytes which are generated by a standard Reed-Solomon algorithm based on the size of the frame in bytes and the number of check-bytes to be included within the corresponding frame. If the receiving interface is not yet

synchronized to its receiving bit stream, the coding field 1268 is set to a predetermined value (e.g. 0.times.F). The coding field 1268 cannot assume a value of zero, which corresponds to an invalid value. If the value of FRAMENUM is equal to 1, then the least significant bit of the coding field 1268 is set to 1 to represent the fact that an ATM cell header compression algorithm has been activated (thus satisfying the limitation: “determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of a compression algorithm used to compress the data”). The present invention specifically concerns an ALA Header Compression Algorithm (ALA-AHCA) that permits 4 octets of a standard 5-octet ATM cell header to be compressed to 2 octets before transmission over a link. With the use of this algorithm, the 4-octets of the cell header are faithfully regenerated at the receiver. This results in a savings of 2 octets per cell, providing approximately a 4% increase in bandwidth (columns 9-10, lines 49-14, columns 6-7, lines 64-5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai and Agrawal’s system/method by incorporating the steps of determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of voice, fax, or a compression algorithm used to compress the data as suggested by Agarwal2. The motivation is that (as suggested by Agarwal2, columns 6-7, lines 64-5) the present invention specifically concerns an ALA Header Compression Algorithm (ALA-AHCA)

that permits 4 octets of a standard 5-octet ATM cell header to be compressed to 2 octets before transmission over a link. With the use of this algorithm, the 4-octets of the cell header are faithfully regenerated at the receiver. This results in a savings of 2 octets per cell, providing approximately a 4% increase in bandwidth. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claims 15 and 16 Cai teaches *a network* (Figures 4, 5 and 6, ATM network) *configured to convey data between at least two terminals* (an originating terminal, Figures 3-6, element 20; and a terminating terminal Figures 3-5, element 50), *the network comprising one or more low-bit-rate arteries* (Figures 4 and 5, any one of links 40); *one or more standard-bit-rate arteries* (Figures 4 and 5, links 30 and 60), *a multiplexer device* (Figures 4, 5 and 6, ATM switch 20 with multiplexing functionality) *in communication with the one or more low-bit-rate arteries* (Figures 4 and 5, any one of links 40) *and the one of more standard-bit-rate arteries* (Figures 4 and 5, links 30 and 60) *wherein the multiplexer device is configured to switch packets transmitted in basic transmission units among several virtual lines* (column 6 line 59, T1 virtual connections (VCs)) *constituted by connections in multiplexed or non-multiplexed mode, wherein data from an originating terminal transmitted on the one or more standard-bit-rate arteries* (Figures 4 and 5, links 30 and 60) *is multiplexed onto the one or more low-bit-rate arteries* (Figures 4 and 5, any one of T1 link 40, TITLE: <u>Inverse multiplexing</u> within asynchronous transfer mode communication networks and abstract, Software inverse

multiplexing within an Asynchronous Transfer Mode (ATM) communication network is provided by a first ATM switch receiving a stream of ATM cells over a high bandwidth communication link. A Segmentation and Re-assembly (SAR) module associated with the first ATM switch thereafter reassembles the received ATM cells into corresponding user packets. Control data identifying the sequence of assembled user packets are added to each user packet and de-assembled into corresponding ATM cells. The de-assembled ATM cells are then communicated over a plurality of low bandwidth communication links (i.e. multiplexed) to a second ATM switch. Column 2 lines 20-24, The present invention provides a method and apparatus for inverse multiplexing a stream of asynchronous transfer mode (ATM) cells received from a high-bandwidth communication link over a plurality of low-bandwidth communication links) this device being positioned upstream to and downstream from a low-bit-rate artery (column 5 lines 46-67, ATM cells are received by the first ATM switch, such as Samsung STARacer ATM switch, over an OC-3 communication link 30. A routing table (RT) 300 then forwards the received ATM cells to a first Segmentation and Re-assembly (SAR) module or chip 310. A first application module 330 associated with the SAR module 310 then assembles the cells into an AAL5 packet and performs a CRC32 check. If the assemble packet is a "good" packet, the SAR module 310 then interrupts an associated central processing unit (CPU) 320 and places the assembled AAL5 packet into a first designated memory location 340. The CPU 320 then adds a sequence number to the placed Protocol Data User (PDU) or AAL5 packet and selects a T1 communication link 40 to communicate the packet. While selecting an outgoing communication link, the

CPU selects a T1 link with the lowest traffic load using a load-balancing algorithm. The PDU or AAL5 packet with the sequence number stored therein is then communicated back down to the SAR module 310. The SAR module 310 de-assembles the user packet into a number of ATM cells and communicates all of the de-assembled ATM cells associated with the particular user packet over the selected T-1 communication link 40); *and a device* (figure 4 and 5, element 210) *associated with a terminating terminal* (figure 3-5, element 50), *wherein the device is configured to extract the packets from the basic transmission units* (column 6 lines 3-20, In a similar fashion, the receiver 230 associated with the second ATM switch 50 receives the ATM cells communicated over one of the T-1 communication links 40 and forwards them to a second SAR module 360 associated therewith. A second application module 370 associated with the second SAR module 360 then reassembles the received ATM cells into a PDU or AAL5 packet and places it in a designated memory location 380. A CPU 330 associated with the second ATM switch 50 re-sequences the received AAL5 or PDU packet with other packets received over other T-1 communication links and transmits them back down to the second SAR module 360. The second SAR module 360 then de-assembles the AAL5 packets into a number of ATM cells and utilize a routing table 390 to transmit the cells over an outgoing OC-3 communication link 60 in a conventional manner), *extract the data from the packets* (column 6 lines 3-20, In a similar fashion, the receiver 230 associated with the second ATM switch 50 receives the ATM cells communicated over one of the T-1 communication links 40 and forwards them to a second SAR module 360 associated therewith. A second application module 370 associated with the second

SAR module 360 then reassembles the received ATM cells into a PDU or AAL5 packet and places it in a designated memory location 380. A CPU 330 associated with the second ATM switch 50 re-sequences the received AAL5 or PDU packet with other packets received over other T-1 communication links and transmits them back down to the second SAR module 360. The second SAR module 360 then de-assembles the AAL5 packets into a number of ATM cells and utilize a routing table 390 to transmit the cells over an outgoing OC-3 communication link 60 in a conventional manner).

Cai does not explicitly teach multiplexing data from plurality of terminals and compressing data at the originating side and decompressing data at the terminating side.

Agarwal in the same or similar field of endeavor teaches plurality of terminals (figure 4A, T0-T2) being multiplexed (abstract, a method and apparatus for providing for segmentation, reassembly and inverse multiplexing of variable sized packets and ATM cells over satellite and wireless links); and compressing data at the originating side and decompressing data at the terminating side (column 15 lines 24-28, column 16 lines 62-63 and column 18, lines 47-51, Virtual Channels (VCs) can be configured to be enabled for data compression, which means that the Spackets belonging to the VC are to be passed through a data compressor/decompressor combination to save bandwidth. Spackets which belong to a VC which has been specified to be compressed are compressed in data compressor 2400. Next, compressed Spackets are sent to Data Decompression module 2600, which decompresses the Spackets belonging to a VC which has been configured to be compressed. Compression and decompression

histories are maintained in the Data compressor 2400 and the decompressor 2600, respectively).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai's system/method by incorporating the steps of multiplexing data from plurality of terminals and compressing data at the originating side and decompressing data at the terminating side as suggested by Agarwal. The motivation is that multiplexing enables data from multiple sources be transmitted via ccmmon lines, instead of dedicating one line for one source; thus conserving resources. Further motivation is that (as suggested by Agarwal, column 15 lines 24-28) Channels can be configured to be enabled for data compression, which means that the packets belonging to a channel are to be passed through a data compressor/decompressor combination to save bandwidth. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

Cai and Agarwal do not explicitly teach determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of voice, fax, or a compression algorithm used to compress the data.

Agarwal2 in the same or similar field of endeavor teaches a fourth field 1268 contains a variable CODING which defines aspects of the corresponding block code

1250 (satisfying limitation “determine a mode of operation”) based on the frame number. By way of example, if the value of FRAMENUM is equal to zero, then the fourth field 1268 (or coding field) represents a suggested value of the number of octets which are to be reserved for the block code 1250. Advantageously, the block code 1250 may be generated in accordance with Reed-Solomon Coding (satisfying limitation “the mode of operation comprising at least one of a compression algorithm used to compress the data”). If Reed-Solomon Coding is employed then the coding field 1268 represents a suggested value of the number of Reed-Solomon octets divided by two that the transmitting interface should employ for its own transmissions. Reed-Solomon Coding is implemented in the form of check-bytes which are generated by a standard Reed-Solomon algorithm based on the size of the frame in bytes and the number of check-bytes to be included within the corresponding frame. If the receiving interface is not yet synchronized to its receiving bit stream, the coding field 1268 is set to a predetermined value (e.g. 0.times.F). The coding field 1268 cannot assume a value of zero, which corresponds to an invalid value. If the value of FRAMENUM is equal to 1, then the least significant bit of the coding field 1268 is set to 1 to represent the fact that an ATM cell header compression algorithm has been activated (thus satisfying the limitation: “determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of a compression algorithm used to compress the data”). The present invention specifically concerns an ALA Header Compression Algorithm (ALA-AHCA) that permits 4 octets of a standard 5-

octet ATM cell header to be compressed to 2 octets before transmission over a link. With the use of this algorithm, the 4-octets of the cell header are faithfully regenerated at the receiver. This results in a savings of 2 octets per cell, providing approximately a 4% increase in bandwidth (columns 9-10, lines 49-14, columns 6-7, lines 64-5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai and Agrawal's system/method by incorporating the steps of determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of voice, fax, or a compression algorithm used to compress the data as suggested by Agarwal2. The motivation is that (as suggested by Agarwal2, columns 6-7, lines 64-5) the present invention specifically concerns an ALA Header Compression Algorithm (ALA-AHCA) that permits 4 octets of a standard 5-octet ATM cell header to be compressed to 2 octets before transmission over a link. With the use of this algorithm, the 4-octets of the cell header are faithfully regenerated at the receiver. This results in a savings of 2 octets per cell, providing approximately a 4% increase in bandwidth. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claim 16, Cai teaches the multiplexer device is incorporated into an ATM switch (Figures 4, 5 and 6, ATM switch 20 with multiplexing functionality).

In regards to claim 17, Cai teaches *network further comprising at least two multiplexer devices* (Figure 3, ATM switches 20 and 50), *wherein, a first multiplexer device is positioned at a first end of a low-bit-rate artery and a second multiplexer device is positioned at a second end of the low-bit-rate artery* (Figure 3, two ends of T-1 communication links), *wherein, the first multiplexer device is configured to extract a plurality of packets from first basic transmission units received from different originating terminals* (column 5 lines 25-29, ATM cells are received by the first ATM switch, such as Samsung STARacer ATM switch, over an OC-3 communication link 30. A routing table (RT) 300 then forwards the received ATM cells to a first Segmentation and Re-assembly (SAR) module or chip 310. A first application module 330 associated with the SAR module 310 then assembles the cells into an AAL5 packet and performs a CRC32 check); and to *multiplex the extracted packets in a second basic transmission unit of a virtual line between tile first end and the second end of the low-bit-rate artery for transmission of the send basic transmission unit from the first end to the second end of the low-bit-rate artery* (column 5 lines 53-56 and columns 5-6 lines 40-2, If the assemble packet is a "good" packet, the SAR module 310 then interrupts an associated central processing unit (CPU) 320 and places the assembled AAL5 packet into a first designated memory location 340. The PDU or AAL5 packet with the sequence number stored therein is then communicated back down to the SAR module 310. The SAR module 310 de-assembles the user packet into a number of ATM cells and communicates all of the de-assembled ATM cells associated with the particular user packet over the selected T-1 communication link 40); *and wherein, the second*

multiplexer device is configured to: extract the packets from second basic transmission unit (column 6 lines 7-11, A second application module 370 associated with the second SAR module 360 then reassembles the received ATM cells into a PDU or AAL5 packet and places it in a designated memory location 380); *determine the terminating terminal to which each of the packets belong; and insert each of the packet into a third basic transmission unit for transmission to the terminating terminal* (column 6 lines 10-20, A CPU 330 associated with the second ATM switch 50 re-sequences the received AAL5 or PDU packet with other packets received over other T-1 communication links and transmits them back down to the second SAR module 360. The second SAR module 360 then de-assembles the AAL5 packets into a number of ATM cells and utilize a routing table 390 to transmit the cells over an outgoing OC-3 communication link 60 in a conventional manner).

Cai does not explicitly teach multiplexing data from plurality of terminals and virtual link.

Agarwal in the same or similar field of endeavor teaches plurality of terminals (figure 4A, T0-T2) being multiplexed (abstract, a method and apparatus for providing for segmentation, reassembly and inverse multiplexing of variable sized packets and ATM cells over satellite and wireless links); and virtual link (column 15 lines 24-28, column 16 lines 62-63 and column 18, lines 47-51, Virtual Channels (VCs) can be configured to be enabled for data compression, which means that the Spackets belonging to the VC are to be passed through a data compressor/decompressor combination to save bandwidth. Spackets which belong to a VC which has been specified to be compressed are

compressed in data compressor 2400. Next, compressed Spackets are sent to Data Decompression module 2600, which decompresses the Spackets belonging to a VC which has been configured to be compressed. Compression and decompression histories are maintained in the Data compressor 2400 and the decompressor 2600, respectively).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai's system/method by incorporating the steps of multiplexing data from plurality of terminals and virtual link as suggested by Agarwal. The motivation is that multiplexing enables data from multiple sources be transmitted via ccmmon lines, instead of dedicating one line for one source; thus conserving resources. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

4. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cai et al. (US PAT 6134246, hereinafter Cai), Agarwal and Agarwal2 as applied to claims 11 and 15 above and further in view of McCormack et al. (US PAT PUB 2006/0133386, hereinafter McCormack).

In regards to claim 20, Cai Agarwal and Agarwal2 teach all the limitations of claim 11 above.

Cai Agarwal and Agarwal2 do not explicitly teach to determine whether a packet has been lost, and to generate conventional data to replace the lost packet.

McCormack in the same field of endeavor teaches If a packet is lost there is no reason for the receiver to request that the sender resend the packet because the packet will arrive too late to be useful for real-time transmission. Thus, each packet of real-time traffic is sent using UDP. If a packet is lost, its loss will be detected by the RTP protocol in the receiving application. The receiving application will then be able to take appropriate measures to handle that loss. For example, because, statistically, the preceding packet will be similar to the lost packet, the receiving application can replace the lost packet with its preceding packet (paragraph 0059).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai Agarwal and Agarwal2's system/method by incorporating the steps of determining whether a packet has been lost, and to generate conventional data to replace the lost packet as suggested by McCormack. The motivation is that (as suggested by McCormack, paragraph 0059), If a packet is lost there is no reason for the receiver to request that the sender resend the packet because the packet will arrive too late to be useful for real-time transmission and the receiving application can replace the lost packet with its preceding generated packet; thus enabling an efficient communication. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claim 21, Cai Agarwal and Agarwal2 do not explicitly teach to determine whether a packet has been lost, and to generate conventional data to replace the lost packet.

McCormack in the same field of endeavor teaches If a packet is lost there is no reason for the receiver to request that the sender resend the packet because the packet will arrive too late to be useful for real-time transmission. Thus, each packet of real-time traffic is sent using UDP. If a packet is lost, its loss will be detected by the RTP protocol in the receiving application. The receiving application will then be able to take appropriate measures to handle that loss. For example, because, statistically, the preceding packet will be similar to the lost packet, the receiving application can replace the lost packet with its preceding packet (paragraph 0059).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai Agarwal and Agarwal2's system/method by incorporating the steps of determining whether a packet has been lost, and to generate conventional data to replace the lost packet as suggested by McCormack. The motivation is that (as suggested by McCormack, paragraph 0059), If a packet is lost there is no reason for the receiver to request that the sender resend the packet because the packet will arrive too late to be useful for real-time transmission and the receiving application can replace the lost packet with its preceding generated packet; thus enabling an efficient communication. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design

incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

5. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cai et al. (US PAT 6134246, hereinafter Cai), Agarwal and Agarwal2 as applied to claim 11 above and further in view of Beshai et al.(US PAT 6339488, hereinafter Beshai).

In regards to claim 12, Cai teaches a table (Figure 5, RT 300) configured to determine the at leas tone low-bit-rate artery over which the packets in the second basic transmission units are to be transmitted transmitting a basic transmission unit (AAL5) to the multiplexer the multiplexer device is configured to extract the packets from the basic transmission units intended to travel through a low-bit-rate artery and for packetization of the packets in new basic transmission units in multiplexed mode for each virtual low-bit-rate artery and transmit first basic transmission units to the multiplexer device for transmission through the at least one low-bit-rate artery and further configured to transparently switch basic transmission units as described in the rejections of claim 11 above (Figure 5 and columns 5-6, lines 40-20).

Cai, Agarwal and Agarwal2 do not explicitly teach a shuffler to carry out a transparent switching of the units that do not have to travel through a low-bit-rate artery.

Beshai in the same field of endeavor teaches a shuffler (An optical shuffler or ADM) to carry out a transparent switching of the units that do not have to travel through a low-bit-rate artery (columns 5-6 lines 47-20).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai, Agarwal and Agarwal2's system/method by incorporating the steps of teach a shuffler to carry out a transparent switching of the units that do not have to travel through a low-bit-rate artery as suggested by Beshai. The motivation is that (as suggested by Beshai, columns 5-6 lines 47-20) shuffler enables a switch to properly direct traffic to correct destination based on traffic parameters and all the traffic control of the channel is performed by these shufflers, including rate control, QOS (quality-of-service) control, etc. as the established paths are rate-regulated, in establishing reliable individual connections within a path. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art

In regards to claim 13, Cai, Agarwal, Agarwal2 and Beshai do not explicitly teach using AAL2 protocol.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai, Agarwal and Beshai's system/method by incorporating the steps of using AAL2 protocol. The motivation is that, AAL2 protocol is for efficient when transmitting voice related data and it would be obvious to choose a standard protocol, which suits the network requirement, the best. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

In regards to claim 14, Cai teaches apparatus is an ATM switch that includes the multiplexer device, and wherein the multiplexer device is configured to switch Common Part Sublayer packets among the several virtual lines constituted by the connections in multiplexed or non-multiplexed mode, the connections comprising ATM connections in multiplexed or non-multiplexed (Cai: columns 5-6 lines 40-20).

In regards to claim 14 Cai, Agarwal, Agarwal2 and Beshai do not explicitly teach using AAL2 protocol.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai, Agarwal, Agarwal2 and Beshai's system/method by incorporating the steps of using AAL2 protocol. The motivation is that, AAL2 protocol is for efficient when transmitting voice related data and it would be obvious to choose a standard protocol, which suits the network requirement, the best. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

6. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cai et al. (US PAT 6134246, hereinafter Cai) in view of Agarwal2 (US PAT 6963570), Agarwal et al. (US PAT 6819658, hereinafter Agarwal) and McCormack et al. (US PAT PUB 2006/0133386, hereinafter McCormack).

In regards to claim 22, Cai teaches apparatus (Figures 4, 5 and 6, ATM switch 20 and 50) for data transmission in a communications network, comprising: a first

adaptation unit (Figure 5, elements 310 and 320) associated with an originating terminal, wherein the first adaptation unit is configured to receive, from the originating terminal, data according to a first protocol (column 5 lines 25-29, ATM cells received over an incoming high bandwidth communication link 30, such as a OC-3), convert the received data into coded frames (AAL5 packet), form a packet of application data comprising a plurality of the coded frames according to a second protocol (AAL5 packet), and insert the packet into a first basic transmission unit at a rate of one packet per unit for transmission to a first end of a low-bit-rate artery (column 2 lines 32-36, a stream of ATM cells are received over an incoming high-bandwidth communication link and assembled into associated packets by a segmentation and re-assembly (SAR) module located within the first ATM switch); a first multiplexer device (Figure 5 element 220) associated with the first end of the low-bit-rate artery, wherein the multiplexer device is configured to extract the packet from the first basic transmission unit and from first basic transmission units received from originating terminals, and to multiplex the extracted packets into a second basic transmission unit for transmission to a second end of the low-bit-rate artery (column 5 lines 53-56 and column 2 lines 32-44, If the assemble packet is a "good" packet, the SAR module 310 then interrupts an associated central processing unit (CPU) 320 and places the assembled AAL5 packet into a first designated memory location 340. A stream of ATM cells are received over an incoming high-bandwidth communication link and assembled into associated packets by a segmentation and re-assembly (SAR) module located within the first ATM switch. A central processing unit (CPU) associated with the SAR module thereafter adds control

data within each packet to identify the position of said packet with respect to the rest of the packets received or to be received by the first switch. The modified packets are then de-assembled by the SAR module into a stream of ATM cells and transmitted over the plurality of low-bandwidth communication links by the transmitter); a second multiplexer device (figure 5 element 230) associated with the second end of the low-bit-rate artery (Figures 4 and 5, any one of links 40), wherein the multiplexer device is configured to extract the packets from the second basic transmission unit (column 6 lines 5-7, the receiver 230 associated with the second ATM switch 50 receives the ATM cells communicated over one of the T-1 communication links 40 and forwards them to a second SAR module 360 associated therewith), determine the terminating terminal to which each of the packets belong, and insert each of the packets into a third basic transmission unit for transmission to the terminating terminal; and a second adaptation unit associated with the terminating terminal, wherein the second adaptation unit is configured to extract the packets from the third basic transmission unit, extract the coded frames from the packets, and to recreate the data from the originating terminal (column 6 lines 7-17, a second application module 370 associated with the second SAR module 360 then reassembles the received ATM cells into a PDU or AAL5 packet and places it in a designated memory location 380. A CPU 330 associated with the second ATM switch 50 re-sequences the received AAL5 or PDU packet with other packets received over other T-1 communication links and transmits them back down to the second SAR module 360. The second SAR module 360 then de-assembles the AAL5 packets into a number of ATM cells and The second SAR module 360 then de-

assembles the AAL5 packets into a number of ATM cells and utilize a routing table 390 to transmit the cells over an outgoing OC-3 communication link 60 in a conventional manner).

In regards to claim 22, Cai do not explicitly teach converting data into coded frames using a compression algorithm.

Agarwal2 in the same field of endeavor teaches converting data into coded frames using a compression algorithm (columns 6-7 lines 54-11, The present invention specifically concerns an ALA Header Compression Algorithm (ALA-AHCA) that permits 4 octets of a standard 5-octet ATM cell header to be compressed to 2 octets before transmission over a link).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai's system/method by incorporating the steps of converting data into coded frames using a compression algorithm as suggested by Agarwal2. The motivation is that (as suggested by Agarwal2, columns 6-7 lines 54-11) data compression can increase bandwidth of a link making the network more bandwidth efficient.

Cai and Agarwal2 do not explicitly teach multiplexing data from plurality of terminals and compressing data at the originating side and decompressing data at the terminating side.

Agarwal in the same or similar field of endeavor teaches plurality of terminals (figure 4A, T0-T2) being multiplexed (abstract, a method and apparatus for providing for segmentation, reassembly and inverse multiplexing of variable sized packets and ATM

cells over satellite and wireless links); and compressing data at the originating side and decompressing data at the terminating side (column 15 lines 24-28, column 16 lines 62-63 and column 18, lines 47-51, Virtual Channels (VCs) can be configured to be enabled for data compression, which means that the Spackets belonging to the VC are to be passed through a data compressor/decompressor combination to save bandwidth. Spackets which belong to a VC which has been specified to be compressed are compressed in data compressor 2400. Next, compressed Spackets are sent to Data Decompression module 2600, which decompresses the Spackets belonging to a VC which has been configured to be compressed. Compression and decompression histories are maintained in the Data compressor 2400 and the decompressor 2600, respectively).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai and Agarwal2's system/method by incorporating the steps of multiplexing data from plurality of terminals and compressing data at the originating side and decompressing data at the terminating side as suggested by Agarwal. The motivation is that multiplexing enables data from multiple sources be transmitted via ccmmon lines, instead of dedicating one line for one source; thus conserving resources. Further motivation is that (as suggested by Agarwal, column 15 lines 24-28) Channels can be configured to be enabled for data compression, which means that the packets belonging to a channel are to be passed through a data compressor/decompressor combination to save bandwidth. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one

based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

Cai and Agarwal do not explicitly teach determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of voice, fax, or a compression algorithm used to compress the data.

Agarwal2 in the same or similar field of endeavor teaches a fourth field 1268 contains a variable CODING which defines aspects of the corresponding block code 1250 (satisfying limitation “determine a mode of operation”) based on the frame number. By way of example, if the value of FRAMENUM is equal to zero, then the fourth field 1268 (or coding field) represents a suggested value of the number of octets which are to be reserved for the block code 1250. Advantageously, the block code 1250 may be generated in accordance with Reed-Solomon Coding (satisfying limitation “the mode of operation comprising at least one of a compression algorithm used to compress the data”). If Reed-Solomon Coding is employed then the coding field 1268 represents a suggested value of the number of Reed-Solomon octets divided by two that the transmitting interface should employ for its own transmissions. Reed-Solomon Coding is implemented in the form of check-bytes which are generated by a standard Reed-Solomon algorithm based on the size of the frame in bytes and the number of check-bytes to be included within the corresponding frame. If the receiving interface is not yet synchronized to its receiving bit stream, the coding field 1268 is set to a predetermined

value (e.g. 0.times.F). The coding field 1268 cannot assume a value of zero, which corresponds to an invalid value. If the value of FRAMENUM is equal to 1, then the least significant bit of the coding field 1268 is set to 1 to represent the fact that an ATM cell header compression algorithm has been activated (thus satisfying the limitation: "determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of a compression algorithm used to compress the data"). The present invention specifically concerns an ALA Header Compression Algorithm (ALA-AHCA) that permits 4 octets of a standard 5-octet ATM cell header to be compressed to 2 octets before transmission over a link. With the use of this algorithm, the 4-octets of the cell header are faithfully regenerated at the receiver. This results in a savings of 2 octets per cell, providing approximately a 4% increase in bandwidth (columns 9-10, lines 49-14, columns 6-7, lines 64-5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai and Agrawal's system/method by incorporating the steps of determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of voice, fax, or a compression algorithm used to compress the data as suggested by Agarwal2. The motivation is that (as suggested by Agarwal2, columns 6-7, lines 64-5) the present invention specifically concerns an ALA Header Compression Algorithm (ALA-AHCA) that permits 4 octets of a standard 5-octet ATM cell header to be compressed to 2

octets before transmission over a link. With the use of this algorithm, the 4-octets of the cell header are faithfully regenerated at the receiver. This results in a savings of 2 octets per cell, providing approximately a 4% increase in bandwidth. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

Cai Agarwal and Agarwal2 do not explicitly teach to determine whether a packet has been lost, and to generate conventional data to replace the lost packet.

McCormack in the same field of endeavor teaches If a packet is lost there is no reason for the receiver to request that the sender resend the packet because the packet will arrive too late to be useful for real-time transmission. Thus, each packet of real-time traffic is sent using UDP. If a packet is lost, its loss will be detected by the RTP protocol in the receiving application. The receiving application will then be able to take appropriate measures to handle that loss. For example, because, statistically, the preceding packet will be similar to the lost packet, the receiving application can replace the lost packet with its preceding packet (paragraph 0059).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai Agarwal and Agarwal2's system/method by incorporating the steps of determining whether a packet has been lost, and to generate conventional data to replace the lost packet as suggested by McCormack. The motivation is that (as suggested by McCormack, paragraph 0059), If a packet is lost there is no reason for the receiver to request that the sender resend the packet because

the packet will arrive too late to be useful for real-time transmission and the receiving application can replace the lost packet with its preceding generated packet; thus enabling an efficient communication. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

7. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cai et al. (US PAT 6134246, hereinafter Cai) in view of Agarwal2 (US PAT 6963570) and Agarwal et al. (US PAT 6819658, hereinafter Agarwal).

In regards to claim 23, Cai teaches apparatus (Figures 4, 5 and 6, ATM switch 20 and 50) for data transmission in a communications network, comprising: a first adaptation unit (Figure 5, elements 310 and 320) associated with an originating terminal, wherein the first adaptation unit is configured to receive, from the originating terminal, data according to a first protocol (column 5 lines 25-29, ATM cells received over an incoming high bandwidth communication link 30, such as a OC-3), convert the received data into coded frames (AAL5 packet), form a packet of application data comprising a plurality of the coded frames according to a second protocol (AAL5 packet), and insert the packet into a first basic transmission unit at a rate of one packet per unit for transmission to a first end of a low-bit-rate artery (column 2 lines 32-36, a stream of ATM cells are received over an incoming high-bandwidth communication link and assembled into associated packets by a segmentation and re-assembly (SAR)

module located within the first ATM switch); a first multiplexer device (Figure 5 element 220) associated with the first end of the low-bit-rate artery, wherein the multiplexer device is configured to extract the packet from the first basic transmission unit and from first basic transmission units received from originating terminals, and to multiplex the extracted packets into a second basic transmission unit for transmission to a second end of the low-bit-rate artery (column 5 lines 53-56 and column 2 lines 32-44, If the assemble packet is a "good" packet, the SAR module 310 then interrupts an associated central processing unit (CPU) 320 and places the assembled AAL5 packet into a first designated memory location 340. A stream of ATM cells are received over an incoming high-bandwidth communication link and assembled into associated packets by a segmentation and re-assembly (SAR) module located within the first ATM switch. A central processing unit (CPU) associated with the SAR module thereafter adds control data within each packet to identify the position of said packet with respect to the rest of the packets received or to be received by the first switch. The modified packets are then de-assembled by the SAR module into a stream of ATM cells and transmitted over the plurality of low-bandwidth communication links by the transmitter); a second multiplexer device (figure 5 element 230) associated with the second end of the low-bit-rate artery (Figures 4 and 5, any one of links 40), wherein the multiplexer device is configured to extract the packets from the second basic transmission unit (column 6 lines 5-7, the receiver 230 associated with the second ATM switch 50 receives the ATM cells communicated over one of the T-1 communication links 40 and forwards them to a second SAR module 360 associated therewith), determine the terminating terminal to

which each of the packets belong, and insert each of the packets into a third basic transmission unit for transmission to the terminating terminal; and a second adaptation unit associated with the terminating terminal, wherein the second adaptation unit is configured to extract the packets from the third basic transmission unit, extract the coded frames from the packets, and to recreate the data from the originating terminal (column 6 lines 7-17, a second application module 370 associated with the second SAR module 360 then reassembles the received ATM cells into a PDU or AAL5 packet and places it in a designated memory location 380. A CPU 330 associated with the second ATM switch 50 re-sequences the received AAL5 or PDU packet with other packets received over other T-1 communication links and transmits them back down to the second SAR module 360. The second SAR module 360 then de-assembles the AAL5 packets into a number of ATM cells and The second SAR module 360 then de-assembles the AAL5 packets into a number of ATM cells and utilize a routing table 390 to transmit the cells over an outgoing OC-3 communication link 60 in a conventional manner).

In regards to claim 23, Cai do not explicitly teach converting data into coded frames using a compression algorithm.

Agarwal2 in the same field of endeavor teaches converting data into coded frames using a compression algorithm (columns 6-7 lines 54-11, The present invention specifically concerns an ALA Header Compression Algorithm (ALA-AHCA) that permits 4 octets of a standard 5-octet ATM cell header to be compressed to 2 octets before transmission over a link).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai's system/method by incorporating the steps of converting data into coded frames using a compression algorithm as suggested by Agarwal2. The motivation is that (as suggested by Agarwal2, columns 6-7 lines 54-11) data compression can increase bandwidth of a link making the network more bandwidth efficient.

Cai and Agarwal2 do not explicitly teach multiplexing data from plurality of terminals and compressing data at the originating side and decompressing data at the terminating side.

Agarwal in the same or similar field of endeavor teaches plurality of terminals (figure 4A, T0-T2) being multiplexed (abstract, a method and apparatus for providing for segmentation, reassembly and inverse multiplexing of variable sized packets and ATM cells over satellite and wireless links); and compressing data at the originating side and decompressing data at the terminating side (column 15 lines 24-28, column 16 lines 62-63 and column 18, lines 47-51, Virtual Channels (VCs) can be configured to be enabled for data compression, which means that the Spackets belonging to the VC are to be passed through a data compressor/decompressor combination to save bandwidth. Spackets which belong to a VC which has been specified to be compressed are compressed in data compressor 2400. Next, compressed Spackets are sent to Data Decompression module 2600, which decompresses the Spackets belonging to a VC which has been configured to be compressed. Compression and decompression

histories are maintained in the Data compressor 2400 and the decompressor 2600, respectively).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai and Agarwal2's system/method by incorporating the steps of multiplexing data from plurality of terminals and compressing data at the originating side and decompressing data at the terminating side as suggested by Agarwal. The motivation is that multiplexing enables data from multiple sources be transmitted via ccmmon lines, instead of dedicating one line for one source; thus conserving resources. Further motivation is that (as suggested by Agarwal, column 15 lines 24-28) Channels can be configured to be enabled for data compression, which means that the packets belonging to a channel are to be passed through a data compressor/decompressor combination to save bandwidth. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

Cai and Agarwal do not explicitly teach determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of voice, fax, or a compression algorithm used to compress the data.

Agarwal2 in the same or similar field of endeavor teaches a fourth field 1268 contains a variable CODING which defines aspects of the corresponding block code

1250 (satisfying limitation “determine a mode of operation”) based on the frame number. By way of example, if the value of FRAMENUM is equal to zero, then the fourth field 1268 (or coding field) represents a suggested value of the number of octets which are to be reserved for the block code 1250. Advantageously, the block code 1250 may be generated in accordance with Reed-Solomon Coding (satisfying limitation “the mode of operation comprising at least one of a compression algorithm used to compress the data”). If Reed-Solomon Coding is employed then the coding field 1268 represents a suggested value of the number of Reed-Solomon octets divided by two that the transmitting interface should employ for its own transmissions. Reed-Solomon Coding is implemented in the form of check-bytes which are generated by a standard Reed-Solomon algorithm based on the size of the frame in bytes and the number of check-bytes to be included within the corresponding frame. If the receiving interface is not yet synchronized to its receiving bit stream, the coding field 1268 is set to a predetermined value (e.g. 0.times.F). The coding field 1268 cannot assume a value of zero, which corresponds to an invalid value. If the value of FRAMENUM is equal to 1, then the least significant bit of the coding field 1268 is set to 1 to represent the fact that an ATM cell header compression algorithm has been activated (thus satisfying the limitation: “determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of a compression algorithm used to compress the data”). The present invention specifically concerns an ALA Header Compression Algorithm (ALA-AHCA) that permits 4 octets of a standard 5-

octet ATM cell header to be compressed to 2 octets before transmission over a link. With the use of this algorithm, the 4-octets of the cell header are faithfully regenerated at the receiver. This results in a savings of 2 octets per cell, providing approximately a 4% increase in bandwidth (columns 9-10, lines 49-14, columns 6-7, lines 64-5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cai and Agrawal's system/method by incorporating the steps of determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of voice, fax, or a compression algorithm used to compress the data as suggested by Agarwal2. The motivation is that (as suggested by Agarwal2, columns 6-7, lines 64-5) the present invention specifically concerns an ALA Header Compression Algorithm (ALA-AHCA) that permits 4 octets of a standard 5-octet ATM cell header to be compressed to 2 octets before transmission over a link. With the use of this algorithm, the 4-octets of the cell header are faithfully regenerated at the receiver. This results in a savings of 2 octets per cell, providing approximately a 4% increase in bandwidth. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

Allowable Subject Matter

8. Claims 1, 2, 4-7, 9, 10, 18, 19 and 25 are allowed.

9. Claims 26-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

10. Applicant's arguments see pages 12-21 of the Remarks section, filed 6/8/2009, with respect to the rejections of the claims have been fully considered but are moot in view of new ground of rejection presented in this office action.

11. Applicant's arguments regarding amended claim 1 and 19 (see pages 12-15) are persuasive. Rejection to claims 1 and 19 has been withdrawn.

Applicant's amendment to claims 11, 15, 22 and 23 necessitated a new ground of rejections presented in this office action. Contrary to Applicant's assertion that prior art do not teach the steps of "determining a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of voice, fax, or a compression algorithm used to compress the data", Examiner respectfully submits that Agarwal2 in the same or similar field of endeavor indeed teaches the cited limitations; Specifically Agarwal2 teaches a fourth field 1268 contains a variable CODING which defines aspects of the corresponding block code 1250 (satisfying limitation "determine a mode of operation") based on the frame number. By way of example, if the value of FRAMENUM is equal to zero, then the fourth field 1268 (or coding field) represents a suggested value of the number of octets which are to be reserved for the block code 1250. Advantageously, the block code 1250 may be

generated in accordance with Reed-Solomon Coding (satisfying limitation "the mode of operation comprising at least one of a compression algorithm used to compress the data"). If Reed-Solomon Coding is employed then the coding field 1268 represents a suggested value of the number of Reed-Solomon octets divided by two that the transmitting interface should employ for its own transmissions. Reed-Solomon Coding is implemented in the form of check-bytes which are generated by a standard Reed-Solomon algorithm based on the size of the frame in bytes and the number of check-bytes to be included within the corresponding frame. If the receiving interface is not yet synchronized to its receiving bit stream, the coding field 1268 is set to a predetermined value (e.g. 0.times.F). The coding field 1268 cannot assume a value of zero, which corresponds to an invalid value. If the value of FRAMENUM is equal to 1, then the least significant bit of the coding field 1268 is set to 1 to represent the fact that an ATM cell header compression algorithm has been activated (thus satisfying the limitation: "determine a mode of operation of a connection between an originating terminal and a terminating terminal using signaling data inserted in the packets and indicating the mode of operation, the mode of operation comprising at least one of a compression algorithm used to compress the data"). The present invention specifically concerns an ALA Header Compression Algorithm (ALA-AHCA) that permits 4 octets of a standard 5-octet ATM cell header to be compressed to 2 octets before transmission over a link. With the use of this algorithm, the 4-octets of the cell header are faithfully regenerated at the receiver. This results in a savings of 2 octets per cell, providing approximately a 4% increase in bandwidth (columns 9-10, lines 49-14, columns 6-7, lines 64-5).

As such, the cited claims 11, 15, 22 and 23 stand rejected.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SALMAN AHMED whose telephone number is (571)272-8307. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on (571)272-3795. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Salman Ahmed/

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